
請勿攀爬
No Climbing

Fig 1. The exhibit is an experiment to plant 'weeds' and spontaneous plants with aesthetic value and has demonstrated that small intervention can change the quality of space significantly.

Cover Story

On Perception of Weeds and Experimentation on Spontaneous Landscape

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ABSTRACT: Proliferated in urban derelict, vacant land and marginal space, the apparently homogenous and disorder form of spontaneous vegetation, conventionally categorized with the term 'weed', is considered as valueless and placeless. Yet, the ubiquity and pervasiveness of these wild plants in urban space have caused a shift in the discourse of landscape aesthetics as well as ecological and cultural meaning for these unintended inhabitants that thrive in the most disturbed urban conditions.

Unlike many of the landscape ideas which have palimpsests of historical and theoretical evolutions, the process and dynamics of unintentional landscapes are ambiguous, complex and difficult to trace their origins and flows. This article scrutinizes our perceptions of urban weeds from the cultural and ecological perspectives and examines the metropolitan attitudes on plants, modern horticultural management and vernacular rural human-plant culture. It contends that spontaneous landscape is not only part of the total experience in urban nature intertwined with cultural, economic and social nexus but also crucial to the exploration of co-existence with multispecies in a hyper-dense urban environment.

Keywords: Unintentional landscape, spontaneous vegetation, ruderal ecology, urban nature, landscape aesthetic, terrain vague

"If our analytical starting point for marginal spaces is reframed in relation to a closer engagement with spontaneous traces of nature, and their social and cultural significance, this can serve as a basis from which to develop a wider terrain of critical reflection over the concept of landscape itself."

—Matthew Gandy, *Unintentional Landscapes*, 2016

Origin of Urban Plants and Anthropocene

Under the Anthropocene, the impacts of human activities have penetrated to every part of this planet. A planetary urbanization conceptual lexicon interprets the ongoing global transformation as a new urban geography interconnecting the environments of every geographical scale and results in "the end of the wilderness". [2] Meaning that there is nowhere in this planet remains pristine and plant distribution will certainly be altered. The severe changes of novel abiotic conditions in urban context due to human activities imply that the original natural ecosystems can no longer be established, even when dispersal barriers are crossed, or original species are restored. [3] Meanwhile, some newer arrivals have warmly accommodated to the novel conditions and established their spontaneous biotas. Obviously, some species would benefit from the modified urban conditions while others experience decline. [4]

While the Anthropocene marks an unprecedented scale of human impact, actually humans have long been agency of ecological change throughout history. The dispersion of human inhabitation has taken place for millennia and, either intentionally or unintentionally, and assisted plants to overcome biogeographical and biophysical barriers. This can be revealed in the diverse biogeographical origins for plants in almost every city.

Nativeness, as a botanical concept, was first outlined by John Henslow in 1835. The native versus exotic arguments in the late ninetieth century and early twentieth century had not contained any meaning that the latter was apocalyptic. In fact, many exotic species were generously embraced as cosmopolitan plants. It is not until the late twentieth century that exotics are judged as "enemies of man and nature" and positioned as opponent of biodiversity. And nativeness, as a cultural concept, is adhered to the right of citizenship. Coates believes our concepts of citizenship: jus soli ("right of territory") and jus sanguinis ("right of blood" or descent) have extended to our notions to plants and animals. It has nothing to do with evolutionary fitness and any considerations on whether a plant has been naturalized to a place or not. Coates elaborates the contrasting perception can be well illustrated by the Eucalyptus in California, which is denounced as an unwanted species but at the same time deemed as an integral part of the California landscape and history.[5] The ostensibly contradictory notion, which is common to most society, is in fact plain and simple: if we grow up in an environment surrounded by non-native plants, these plants form a majority part of our personal experience and memory to 'nature'.

Under Anthropocene, restoring some of the degraded ecosystems to the 'perfect' historical status is impossible. Furthermore, all landscapes are, in fact, non-static if viewed on a geological timescale. The concept of a 'perfect' reference state is inherently flawed. From evolutionary standpoint, and all plants have been facing environmental stress before and after human settlement, they must evolve to adapt changes regardless of selection pressure or they will perish. In the modern era, from a human perspective and along with urban development, it is a world of 'all strangers in a strange environment'. [6] Many 'weeds' with ecosystem services

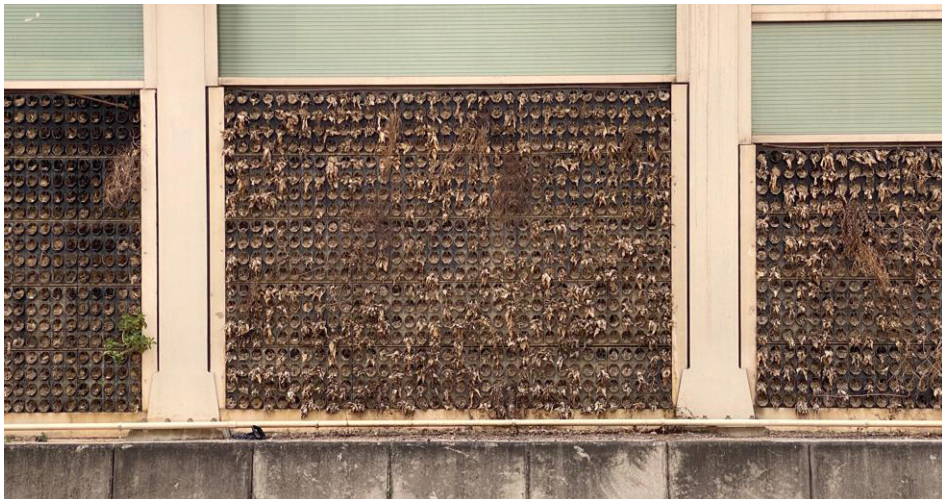

Fig 2 & 3. Intended greening on a vertical green wall fails to survive and occupied by spontaneous plants.

potentially ideal for resilient and adaptive landscape design are unharnessed. To argue for the local authenticity of urban plants with mixed up geographical origins and reduce the matter to a native verse exotic argument become totally lost of focus.

Unintentional Landscape and Terrain Vague

Landscape studies typically examine different forms of urban development based on rational and utilitarian design and planning intentions with traceable historical and theoretical palimpsests. Yet, the process and dynamics of unintentional landscape, which are ambiguous, complex and difficult to track the origins and flows, are often outside the mainstream discourse. In fact, compare with designed landscape, unintentional landscape may have outweighed the former in terms of their magnitude when transforming the urban environment.

Unintentional landscape is defined as "an aesthetic encounter with nature that has not been purposively created." it is not an "idealised landscape that conforms to some pre-existing conception of the innate relations between nature and culture, and it is not a designed landscape allied to particular social or political goals. It is a landscape in spite of itself." [1] The concept is connected to other urbanist terminologies, such as terrain vague, urban void,

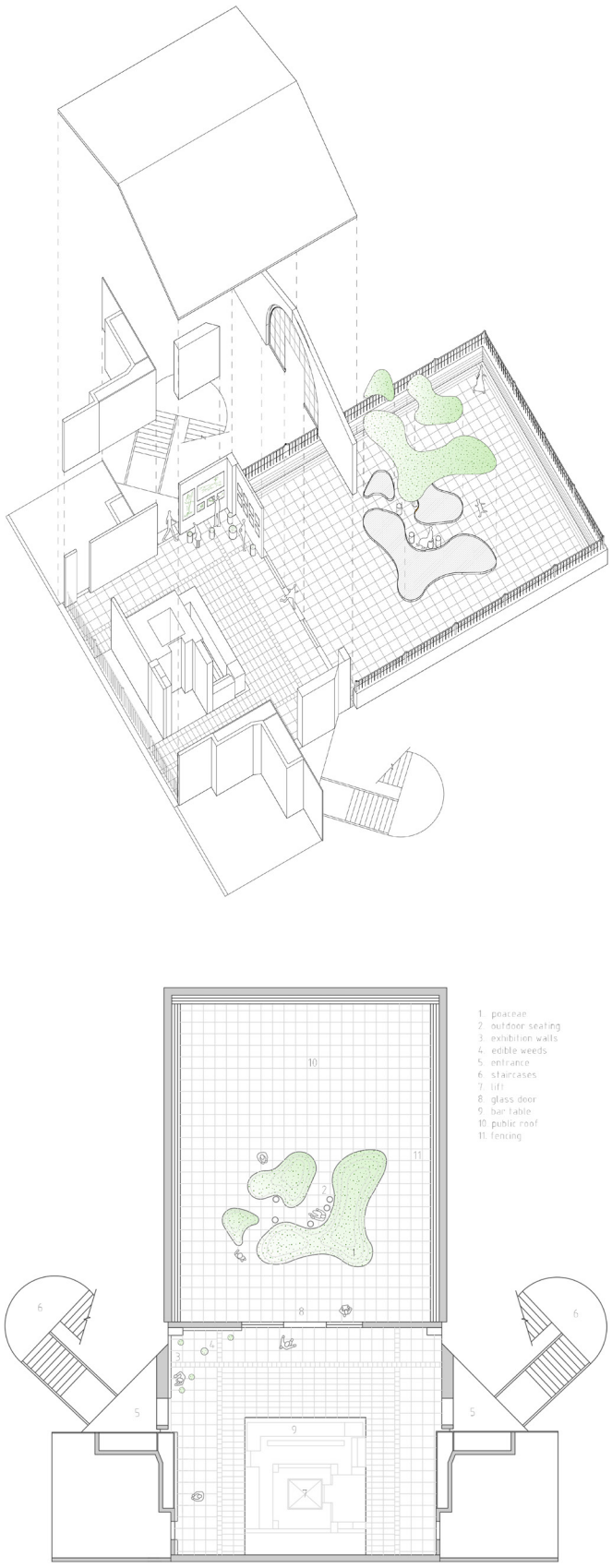

Fig 4 & 5. Plan and axon of the WEEDsilience exhibit at Hong Kong Shenzhen Bi-City Biennale of Urbanism Architecture in 2022.

marginal land, loose space and vacant land, and ecological concepts, such as spontaneous vegetation, novel ecosystem, ruderal ecology and cosmopolitan ecology.

Since Ignasi de Solà-Morales Rubio published the article 'Terrain Vague', it has become a key literature to architectural and urban studies on urban voids and derelict space. [7] His writing unveils a different understanding and appreciation on landscape of disrepair and apparently with no particular value. Terrain vague is about being "empty, unoccupied". It is a complete antithesis of conscious landscape design. [8] Though clearly the result of human activities, terrain vague, with its spontaneous nature, is inherently opposite to design. As de Sola-Morales Rubio's elaborates,

> Architecture's destiny has always been colonization, the imposing of limits, order, and form, the introduction into strange space of the elements of identity necessary to make it recognizable, identical, universal. In essence, architecture acts as an instrument of organization, of rationalization, and of productive efficiency capable of transforming the uncivilized into the cultivated, the fallow into the productive, the void into the built.

Yet, terrain vague also implies 'free, available, unengaged', a space of adventure, imagination, and self-discovery that other urban realms seldom offer.

Girot concludes that terrain vague has 'not only caused a shift, but also effected a profound, and very critical, transformation of our appreciation of landscape aesthetics.' At this point, the architectural terminology converges with the understanding of spontaneous vegetation in urban ecology in the sense that it embeds a relationship between the absence of use while at the same time promises possibilities in a space.

Spontaneous Vegetation and Perceptions of Urban Weeds

Spontaneous vegetation is defined as "all plants that develop without intentional horticultural input." [9] It is not just a regional-specific phenomenon, it occurs everywhere on the planet. These cosmopolitan plants can be the inhabitants arrived before human settlements, species that escaped from or were left over in agricultural sites, or unintentionally introduced exotic species. [10] Early study of spontaneous vegetation can be traced back to Flora of the Colosseum of Rome in 1855 [11] where botanist Richard Deakin conducted study of spontaneous vegetation on ruins. After World War II, German ecologists pioneered to study the flora and fauna established in the derelict and vacant land in the cities. Urban ecologist such as Herbert Sukopp observed and argued that the urban conditions were able to nurture biotopes and wildlife. Human influence is thus not simply a cause of environmental deterioration but also shapes the urban ecology. Richard Hobbs referred these patches and corridors of spontaneous vegetation as novel ecosystem which has the potential to change the functioning of ecosystem as a result of human actions but do not depend on continuous intervention or maintenance.

The presence of spontaneous vegetation, similar to terrain vague, therefore, is in an inherent conflict with the conventional practice of design and management presuming that there is a 'scientific' and 'systemic' approach that could instruct interventions and maintenance based on certain apparatus to completely control 'nature'. Any non-design and unintended parameters shall be erased and rectified to maintain the 'harmonic' man-made environment. Despite many are captivated by the wilderness of spontaneous vegetation, urban horticultural management commonly termed them as 'weeds' and eradicate them due to their unpredictability, self-willed nature that depart from the banal and carefully cultivated and managed plantings in parks and gardens.

A "weed", hence, is a plant outside the capitalism system that ethnographer Anna Tsing laments that this is the "latent commons of weeds." where "one stand-alone asset matters; everything else becomes weeds or waste." [12] It may perhaps also be a sign that conventional design and planning are lack of understanding on natural principles that govern the urban natural systems.

Our perception of 'weed' is culturally constructed and established based on piecemeal knowledge. We have a tendency to categorize things in order to make sense of this world. Ritvo argues that the opposition between the wild and the domesticated is anthropocentric. It is a universally applicable classification to organize nature in order to subsume all living things into one of the two categories. [13] The dichotomies of experience - wild and domesticated, native and exotic, good and bad - in polar forms facilitate our minds to pattern the world.[14] According to our "metropolitan view", 'weeds' are:

- useless and counterproductive;
- untamed, wild, messy and ugly;
- antithetical, exotic and invasive to our environment;
- a category of unidentifiable and similar looking plants, especially herbs;
- indicator of site abandonment or poor management

However, from an ecological perspective, 'weeds' are equivalent to spontaneous vegetation that is adaptive to urban disturbance exhibiting great resilience and are 'survival of the fittest' in the urban area. Not all 'weeds' are the cause of environmental degradation but more often a symptom of it.

Functions of Spontaneous Vegetation

Spontaneous vegetation can be deemed as a natural process reclaiming the urban voids regardless of their origins. Spontaneous vegetation are now recognized as part of the ecological infrastructure of the city extending to roles such as flood

control, erosion control, accumulation of organic matter, carbon sequestration, air, water and soil purification, and the mitigation of the urban heat island effect. Green space in urban environment, together with urban derelict, vacant land and marginal space, form part of the urban habitat essential to ecological functions and well beings of human. [15][16]

One of the key functions of spontaneous vegetation is that they are refuges of many species. In some scientific researches, it is revealed that there are more plants and insects species found in wastelands than that in other green spaces. [17][18] The heterogeneity of the environment creates different microhabitats, harbours a wide range of plants where the composition is unique to each piece of mosaic. And in turn, they attract different fauna. For insects, studies found that the volume of invertebrates captured in brownfields can be more than the sum in certain forests and lawns. [19]

Similar to the ornamental and horticultural plants in the city, both native and exotic, spontaneous vegetation interacts with fauna and supply some source of food to local species such as birds, bats, bees and butterflies. Ecologist Richard Corlett observed that birds in Hong Kong consume the fruits from 'weedy' plants such as *Passiflora foetida* L., *Solanum americanum* Mill., *Solanum torvum* Sw., and *Lantana camara* L., etc. Even the notorious L*eucaena leucocephala* (Lam.) de Wit, which is considered as one of the most invasive species in Hong Kong (though the Hong Kong Herbarium has defined its locality as "cultivated and naturalized"), is found to support a specific psyllid, *Heteropsylla cubana Crawford*, 1914, and provide major food for yellow-browed warblers as well as other avifauna including Japanese white-eyes, bulbuls and other warbles in winter.[20] By observations, many of the flowering 'weeds' in Hong Kong are visited by bees and butterflies, such as *Asclepias curassavica* L., *Stachytarpheta jamaicensis* (L.) Vahl and *Wedelia trilobata* (L.) Hitchc. While grasses from the Poaceae family like Panicum maximum Jacq. and Setaria spp. also attract seed-eating birds, such as the Scaly Breasted Munia.

It is not to give the illusion that all exotic species should be welcomed and could replace native plant communities, but to reveal the fact that exotic species, particularly those naturalized and not

invasive, do have certain ecological values and should not be overlooked especially when native species no longer remain in or possible to be reintroduced to the urban area.

It is the lack of knowledge and research that make 'weeds' seemingly useless.

Fourth Nature and Designing Wilderness

The recent appreciation of 'wild' landscape re-generates a new curiosity on naturalistic design. In fact, these approaches had already claimed our interest for a long time. For instance, the New Perennialism pays tribute to self-seeded and naturally emerged landscape that is place-specific, native and support biodiversity, despite the planting design and aesthetic quality are in fact carefully designed. The unveiling of an age-old inattentiveness to 'wild' requires a new representation of 'wild' urban space and the language to describe them.

Traditionally, 'wilderness' interpreted by conservationist focuses on preserving the remaining natural resources and also reverting the environment back to certain 'past' and 'pristine' conditions. There is no doubt that we should conserve the remnant patches of relatively less modified 'nature'. But at the same time, we have to acknowledge that climate change and urbanization have created a new and likely to be irreversible set of abiotic settings in urban that the old biomes can no longer fit in. Urban ecologist Ingo Kowarik employs the "Four Natures approach" as a conceptual framework to understanding wilderness in urban context – First Nature as remnants of pristine ecosystem; Second Nature as rural cultural landscapes; Third Nature as urban green space and Fourth Nature as novel urban green spaces emerges spontaneously. [21]

The Fourth Nature has created a new horizon to embrace novel urban nature without conflicting with the conservation notion. It has also posed a question to conventional urban green space design and opened up an alternative to urban space for city dwellers to connect with 'nature'. Kühn

Fig 6 & 7. The exhibit is an experiment to plant 'weeds' and spontaneous plants with aesthetic value and has demonstrated that small intervention can change the quality of space significantly.

Fig 8. *Parnara guttata* found at the exhibit trial.

pushes the idea further and advocates the use of spontaneous vegetation in landscape design, he suggested interventions on spontaneous vegetation in order to increase the attractiveness of the plants. [9]

An Exhibition, Experiment and Ongoing Research

WEEDsilience started an exhibition featured at the Hong Kong Shenzhen Bi-City Biennale of Urbanism \ Architecture in 2022. Part of the exhibit was an experiment using spontaneous vegetation as the planting palette during the two-month exhibition period. The 25m² planting area is mixed with eight 'weedy' and ornamental grasses (Poaceae) and sedges (Cyperaceae), namely—*Cyperus surinamensis* Rottb., *Cyperus odoratus* L., *Pennisetum alopecuroides* (L.) Spreng., *Eleusine indica* (L.) Gaertn., *Panicum maximum* Jacq., *Echinochloa crusgalli* (L.) P. Beauv., *Setaria viridis* (L.) P. Beauv. and *Muhlenbergia capillaris* Trin. Some preliminary observations can be discussed.

First of all, the experiment has demonstrated that small intervention can change the quality of a space significantly. The ecological simulacra approach, mimicking the spontaneous vegetation commonly found in the urban Hong Kong, generated urban wilderness in an otherwise barren space and refresh visitors' experience in rural and countryside. It evoked a sense of appreciation on different kind of aesthetic quality in urban space. From the practical perspective, apart from *Muhlenbergia capillaris* Trin. and *Pennisetum alopecuroides* (L.) Spreng., two horticultural species for ornamental purpose, all the Poaceae plants were able to establish with minimal maintenance. In fact, apart from the first 2 to 3 weeks when the plants were newly planted, watering was completely absent. There was literally no horticultural maintenance carried out, a sharp contrast to the normally maintenance dependent urban green space. Within a couple of weeks, a regular group of tree sparrow had

Fig 9. *Aerial view of the WEEDsilience exhibit.*

Fig 10. *Tree sparrows are attracted by Echinochloa crusgalli for consumption of plant seeds.*

occupied the space planted with *Setaria viridis* (L.) P. Beauv. for consumption of plant seeds. The *Echinochloa crusgalli* (L.) P. Beauv. attracted butterflies, offering larvae food for *Parnara guttata* (Bremer & Grey, 1853). Although the birds and butterflies observed were common species, nonetheless, the Poaceae plants still served as a temporary refuge for urban wildlife in the otherwise vacant concrete rooftop difficult for ornamental plants or plants with conservation value to survive without intensively maintenance.

Unintendedly, two plant species commonly known as 'weeds', *Imperata cylindrica* (L.) Raeusch. var. major (Nees) C. E. Hubb. and *Melinis repens* (Willd.) Zizka were observed. A situation where a planting bed full of 'weeds' were 'invaded' by other 'weeds', making the term 'weeding' lost its meaning completely. This is exactly where the dynamic natural process of spontaneous vegetation has blurred the boundary of conventional landscape design and our understanding of urban ecology. The exhibition was a very small experiment testing the idea of designing wilderness. More complex processes where spontaneous vegetation passes diverse types of environmental filters and grows freely in urban area are awaiting to be uncovered. That knowledge may give us a new perspective to future landscape.

New Perspective

Many of the spontaneous plants are labeled with malicious metaphors. However, in the light of Anthropocene, the boundary between 'nature' and human is blurred. The city becomes naturalized, and the nature becomes urbanized. [22] Resilient and adaptive design concepts, such as blue-green infrastructure, sponge city, nature-based solutions, are celebrated as splendid landscape approaches to tackle climate change and biodiversity loss. Many of the recent projects claimed to have adopted these initiatives deploy similar planting palette that traditional open space design employs and require high maintenance input. The essence of these design concepts lies in their abilities to require minimal human input and let the 'nature' to do its own job. For instance, plants do not rely on artificial irrigation to survive in the wild – they either adapt or perish.

A humorous reminder is that humans have been "battling with weeds" for over 10,000 years, dating back to the dawn of agriculture. And we are still endlessly spending enormous energy and time to eliminate these "tiny and primitive" competitors. Whether we like it or not, nature will participate in deciding what plants can stay in all kinds of landscapes unless we invest resources to counterbalance the force. In this regard, natural systems and spontaneous vegetation deserve more research to cumulate knowledge systematically regarding their functions and behaviors.

Conventional design and planning dissect human-nature and urban-rural relations. The dualities have simplified the complex interactions between human activities and the environment by positioning nature as an outsider. Spontaneous vegetation challenges the perception that nature is something to be managed and utilized by humans. It has formed its own system independent to human intention and find the loopholes to claim its existence. This rupture opens up the possibility that "nature" can be an integral part of the city. A more constructive dialogue should hence be based on the management of spontaneous vegetation that is beneficial to the well beings instead of a simplistic dichotomy of 'nature' and human which ignores the interaction between the two. Urban ecologists take the stance that humans and the settlements we build are integral parts of nature. If the quest of design in this era is to recover an apparatus to pursue co-existence with multispecies in urban landscape, we have to reframe the understanding of landscape from an epistemological perspective. To recalibrate our perception of plants will allow us to have a boarder imagination in urbanism.

WEEDsilience has been evolving to a continuous research, education and advocacy project which investigates the aesthetics and functions of spontaneous vegetation beyond conventional landscape design and planning. By exploring the neglected nature in our everyday life and and investigating from ecological and ethnobotanical perspectives, we scrutinize our perception of "weeds". This project advocates the conservation of rural habitats, meanwhile attempts to incorporate unintended plant into resilient urban designs to create urban wilderness. By reclaiming human-plant symbiosis, we explore the way to co-exist with multispecies in a hyper-dense urban environment.

Fig 11. *Thumbnail Plants: Spontaneous plants are ubiquitous in urban context.Yet, it has the least concerns from designers and planners*


Wu Yee Sun Block
Jockey Club Clinical Tower
Chien Foundation Block

Fig 12. *Rooftop garden at Lee Shau Kee Architecture Building occupied by spontaneous plants, which has defined the character of the space.*

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